REMARKS

Claims 5, 6, 8, 12, 14-15, and 17-24 are pending in the application. Claims 5, 6, 8, 10, 12, 14-15, and 17-24 are rejected under 35 U.S.C. § 112, first paragraph and claims 5, 6, 8, 10, 12, 15, 17, and 19-24 are rejected under 35 U.S.C. § 102[1].

Applicants thank Examiners Guidry and Sullivan for the helpful personal interview conducted on May 18, 2006[2] with Applicants' representative, James DeCamp. Applicants address the rejections set forth in the January 26, 2006 Office Action and the matters discussed in the May 18th interview as follows.

Case History

Applicants note that the present application was filed on July 13, 2001. A first Office Action on the merits was mailed on November 26, 2003 and a final Office Action was mailed on August 24, 2004. Applicants filed a Request for Continued Examination on February 24, 2005 and non-final Office Action was mailed on May 4, 2005. As such, the present final Office Action is the fourth Office Action on the merits that the Office has issued. Moreover, Applicants note that Applicants' representatives have conducted two personal interviews with the Examiner, on July 20, 2005 and May 18, 2006, in an attempt to resolve any remaining issues.

In short, Applicants, throughout the prosecution of the present application, have addressed the Office's rejections and submit, as set forth below, that the claims, as

[1] Applicants note that claim 10 was canceled in Applicants' November 4, 2005 reply.

amended, are fully supported by the specification as filed and are free of the cited art.

Claim Amendments

Claims 5 and 14 have been amended to require the second polypeptide to include a granulocyte-colony stimulating factor receptor deficient in amino acid residues 5 (Glu) through 195 (Leu) of wild-type granulocyte-colony stimulating factor receptor, or a granulocyte-colony stimulating factor receptor deficient in amino acid residues 5 (Glu) through 195 (Leu) and amino acid residues 725 through 756 of wild-type granulocyte-colony stimulating factor receptor. Support for this amendment is found, for example, at page 9, lines 16-24, of the specification, and in Figures 7 and 8.

Claim 8 has been amended to require the second polypeptide to include a granulocyte-colony stimulating factor receptor, or a granulocyte-colony stimulating factor receptor deficient in amino acid residues 5 (Glu) through 195 (Leu) of wild-type granulocyte-colony stimulating factor receptor, or a granulocyte-colony stimulating factor receptor deficient in amino acid residues 5 (Glu) through 195 (Leu) and amino acid residues 725 through 756 of wild-type granulocyte-colony stimulating factor receptor. Support for this amendment is found, for example, at page 9, lines 16-24, of the specification, and in Figures 7 and 8.

In view of claim 12, the language of claim 22 has been amended.

The present amendments were made solely to expedite prosecution and Applicants

[2] Applicants note that the Interview Summary incorrectly sets forth the date of the interview as May 9, 2006.

reserve the right to pursue canceled subject matter in this or in a continuing application.

Rejection under 35 U.S.C. § 112, first paragraph

Claims 5, 6, 8, 10, 12, 14, 15, and 17-24 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. In particular, the Office asserts (page 3 and page 7; emphasis original):

> [T]he claims are directed to a genus of nucleic acid structures (i.e., vector molecules) encoding fusion proteins comprising deletion of *any portion* of the G-CSFR [granulocyte-colony stimulating factor receptor] extra-cellular domain where said truncated G-CSFR must correspond to proliferation activity.
>
> * * *
>
> In the instant case, Applicant describes a single species comprising a fusion protein of the G-CSFR extracellular domain deleted. Therefore, the disclosure does not describe additional fusion proteins where there are deletions. In sharp contrast, the genus encompasses thousands of possibilities, with no clear guidance in the disclosure or in the art, as to any common feature or characteristic that will correspond to proliferation activity, irrespective of the location, combination or number of deletion(s).

Applicants submit that the claims, as amended, are free of this basis for rejection.

The claims as amended require the G-CSFR portion of the fusion protein encoded by the vector to include a granulocyte-colony stimulating factor receptor (claim 8), or a granulocyte-colony stimulating factor receptor deficient in amino acid residues 5 (Glu) through 195 (Leu) of wild-type granulocyte-colony stimulating factor receptor, or a granulocyte-colony stimulating factor receptor deficient in amino acid residues 5 (Glu) through 195 (Leu) and amino acid residues 725 through 756 of wild-type granulocyte-colony stimulating factor receptor (claims 5, 8, and 14). As such, the claims are not

directed to "any portion" of the G-CSFR, but to specific portions recited in the specification as filed.

In particular, in Example 1, Applicants describe constructing a chimeric protein including "the entire G-CSF receptor" and the ligand binding domain of the estrogen receptor ("GCRER") (see e.g., page 9, lines 12-14). As such, a fusion protein having a first polypeptide including a ligand binding domain of a steroid hormone receptor and a second polypeptide including a granulocyte-colony stimulating factor receptor ("GCR") is described in the specification as filed.

In addition, for example, at page 9, lines 16-20, the specification teaches construction of a mutant of the GCRER fusion protein that is deficient in the 5th residue, Glu, through the 195th residue, Leu, of the granulocyte-colony stimulating factor receptor ("GCRΔ(5-195)/ER"). Further, for example, at page 9, lines 21-24, the specification describes a GCRER fusion protein that, in addition to lacking residues 5-195, lacks residues 725-756 ("GCRΔ(5-195, 725-756)/ER"). Accordingly, the specification as filed also describes fusion proteins having a first polypeptide including a ligand binding domain of a steroid hormone receptor and either a granulocyte-colony stimulating factor receptor deficient in amino acid residues 5 (Glu) through 195 (Leu) of wild-type granulocyte-colony stimulating factor receptor ("GCRΔ(5-195)"), or a granulocyte-colony stimulating factor receptor deficient in amino acid residues 5 (Glu) through 195 (Leu) and amino acid residues 725 through 756 of wild-type granulocyte-colony stimulating factor receptor ("GCRΔ(5-195, 725-756)").

Applicants further note that the sequences of a GCR was known in the art at the time the application was filed. In support of this assertion, Applicants submit herewith copies of Fukunaga et al. ("Expression Cloning of a Receptor for Murine Granulocyte Colony-Stimulating Factor," Cell 61(2), 341-350 (1990); Exhibit 1) and Fukunaga et al. ("Functional domains of the granulocyte colony-stimulating factor receptor," EMBO J. 10(10):2855-65 (1991); Exhibit 2). The claims, as amended, are directed to fusion proteins containing a GCR (or specific mutants). Given that the sequence of a GCR was known at the time of filing, one skilled in the art would recognize whether a fusion protein contains a GCR sequence or the particular mutant GCR sequences recited in the claims.

The Federal Circuit has indicated that § 112 does not impose a *per se* rule requiring recitation in the specification of the nucleotide sequence of claimed DNA, when that sequence is already known in the field. *Capon v. Eshhar,* 418 F.3d 1349, 1360, 76 U.S.P.Q. (BNA) 1078 (Fed. Cir. 2005). The Federal Circuit, in reversing the Board's conclusion that the written description requirement necessitated a listing of the specific nucleotide sequences of the claimed DNA, stated:

> The chimeric genes here at issue are prepared from known DNA sequences of known function. The Board's requirement that these sequences must be analyzed and reported in the specification does not add descriptive substance. The Board erred in holding that the specifications do not meet the written description requirement because they do not reiterate the structure or formula or chemical name for the nucleotide sequences of the claimed chimeric genes. (Emphasis added.)

Capon, 418 F.3d at 1358.

The written description requirement must be applied in the context of the particular invention and the state of the knowledge in the art. Applicants submit that the specification need not describe GCR sequences known in the art at the time of filing to meet the written description requirement for the present claims.

For all the above reasons, there can be no question that one skilled in the art would recognize that Applicants, at the time of filing, were in possession of the fusion proteins encompassed by the present claims. The written description rejection of claims 5, 6, 8, 10, 12, 14, 15, and 17-24 should be withdrawn.

Rejection under 35 U.S.C. § 102(e)

Claims 5, 6, 8, 10, 12, 15, 17, and 19-24 are rejected under 35 U.S.C. § 102(e) as being anticipated by Capon et al. (U.S. Patent Number 5,838,544; "the '544 patent"). The Office, at page 12, asserts that "Capon's teachings is deemed sufficient to envisage a fusion construct encoding a fusion protein comprising [a] ligand binding domain of a steroid hormone [receptor] and a proliferation domain of G-CSF[R]." Applicants disagree. However, to expedite prosecution, claims 5 and 14 have been amended to recite that the second polypeptide includes a granulocyte-colony stimulating factor receptor deficient in amino acid residues 5 (Glu) through 195 (Leu) of wild-type granulocyte-colony stimulating factor receptor, or a granulocyte-colony stimulating factor receptor deficient in amino acid residues 5 (Glu) through 195 (Leu) and amino acid residues 725 through 756 of wild-type granulocyte-colony stimulating factor receptor.

To anticipate a claim, each and every element set forth in the claim must be found, either expressly or inherently, in a single prior art reference. The '544 patent does not describe a granulocyte-colony stimulating factor receptor deficient in residues 5-195 or residues 5-195 and 725-756 of wild-type granulocyte-colony stimulating factor receptor, much less a fusion protein containing such granulocyte-colony stimulating factor receptor portions. Consequently, the '544 patent fails to describe all of the elements of claims 5 and 14, as amended. The anticipation rejection of claims 5 and 14, as amended, and their dependent claims, should be withdrawn.

Applicants submit that claim 8 is also free of the anticipation rejection over the '544 patent. In particular, claim is directed to a vector including both a desired exogenous gene and a gene encoding a fusion protein. The '544 fails to describe a single vector that includes an exogenous gene as well as a gene encoding a fusion protein. Accordingly, the '544 patent does not describe all of the elements of claim 8 and, therefore, cannot anticipate this claim. The § 102 rejection of claim 8, and its dependent claims, should be withdrawn.

CONCLUSION

Applicants submit that the application is now in condition for allowance, and this action is hereby respectfully requested.

Enclosed are a Petition to extend the period for replying to the final Office Action for two (2) months, to and including June 26, 2006, and a check in payment of the required extension fee.

If there are any additional charges or any credits, please apply them to Deposit Account No. 03-2095.

Respectfully submitted,

Date: 26 June 2006

James D. DeCamp, Ph.D.
Reg. No. 43,580

JAN M. TITTEL, PH. D.
Reg. No. 52,290

Clark & Elbing LLP
101 Federal Street
Boston, MA 02110
Telephone: 617-428-0200
Facsimile: 617-428-7045